# *Managing the Consequences of a Chemical Attack*
# A Systematic Approach to Rescue Operations

Montgomery County Fire and Rescue Service (MCFRS)
Montgomery County, Maryland


If the number of live victims exposed to and impaired by a chemical agent(s) exceeds the availability of personnel in level A suits to rescue in a timely manner, then the Incident Commander must consider the use of other acceptable personal protective ensembles. The purpose of this Quick Reference is to give first responders guidelines to help them develop an action plan to safely and effectively rescue live victims during these extraordinary and extreme conditions. Saving **live victims** is the rescue mission, while minimizing risk of harm to the rescuers.

**Note:** The Level A suit represents the highest level of protection to emergency responders against both respiratory and skin hazards of exposure to chemical (and biological) warfare agents.

**Note:** Unless the chemical agent(s) is (are) identified by class or name, first responders must gather information about the incident based on: signs and symptoms of casualties, comments from casualties and onlookers, site specific information, their own observations and reconnaissance, and information available through intelligence provided by law enforcement officers. Always assume that mustard agent is present, until otherwise ruled out.

**Note:** First responders are cautioned not to "automatically" assume that the incident involves a super toxic chemical agent. The released material could be a substantially less toxic industrial chemical or a riot control agent such as pepper spray.

**Key Factors and Steps to Help Decide Whether Rescue is a "Go" or a "No Go" Situation:**

- Weather Conditions: Consider the impact of wind direction and speed, temperature and humidity, and precipitation on the behavior and spread of the chemical agent(s) and on emergency operations. Use on-scene weather monitoring equipment if available.

- Scene Hazard Assessment: Avoid "tunnel vision." Don't just assume chemical-related hazards. Also consider the possible presence of biological agents, radiological materials, and/or explosive devices.

- Reconnaissance (Recon): Conduct Recon to determine if live victims are still in the area of the chemical agent release. Unless wearing a Level A suit, just view the contaminated area through a closed window, an entrance doorway, or other reasonably safe location, to gather victim information. The Recon team must wear at least their protective clothing, with openings taped, and using SCBA. Using duct tape, at least tape shut the storm flap (pants and coat), and tape over the cuffs (arms and legs). Review separate document for proper taping details.

- Victim Information:

Location: Are casualties visible near an entrance? Are they in the line-of-sight? Can they be heard? Estimate how long it would take to reach and remove them.

Number: If there are enough hazmat team personnel in Level A suits available to rescue live victims in a timely manner, use them. Otherwise, consider using personnel who are wearing an acceptable protective clothing alternative, with SCBA, as approved by the Incident Commander.

Condition: Are casualties ambulatory or non-ambulatory? Signs and symptoms? Traumatic injuries? Entanglement? Mental state?

Exposure: Estimate how long they have been exposed to the chemical agent(s). 20 minutes? 30 minutes? Longer? Shorter?

- Rescue and Standby Teams: Select at least two personnel per team with appropriate personal protection. Ensure they are hydrated and wearing cooling vests, if available.

- Chemical Agent Hazard Reduction: Consider use of positive pressure ventilation (PPV) fans (electric preferred) or other fans to reduce or redirect vapor or aerosol concentration. Be sure that use of these fans will not spread chemical agent to endanger other people. If fans are acceptable, they should be placed in service while rescuers are donning their protective ensemble.

- Review Information about Chemical Warfare Agents (CWA): Remember, all chemical warfare agents are heavier than air, except for HCN. The higher the vapor pressure of a CWA, the higher its rate of evaporation (volatility). Temperature and humidity can affect CWA properties and exposure risk.

- SCBA (positive pressure): SCBA must be used for all rescue missions. SCBA provide an inhalation Protection Factor (PF) of 10,000. This is excellent respiratory protection.

- Personal Protective Ensemble (PPE): Rescue personnel must wear a Tyvek F® suit under personal protective clothing, with butyl gloves worn under NFPA-compliant gloves as detailed in a separate reference. (The incident commander may consider other ensemble alternatives if specialized chemical suits are not readily available.)

- Rescue Team Exposure Time: Limit the initial exposure time to 2-3 minutes. No entry team will re-enter the contaminated area unless authorized and extreme circumstances clearly warrant doing so. Based on chemical warfare agent(s) released, the quantity, its properties, the circumstances surrounding its release, and vapor suppression measures used, the Incident Commander may allow the rescue personnel to operate in the contaminated area for a longer period.

  **Caution:** Because concentrations of the chemical agent released in a building could result in different concentrations in the rooms and corridors, victims should be removed through doors or windows that lead directly to the outside. If this is not possible, the rescuers should consider the use of escape masks or chemical masks by victims who must leave through other rooms and corridors to reach the outside.

  **Caution:** When deciding which way to remove victims, remember that the chemical agent released is likely to be heavier then air. So, victims at ground level should be removed through a window or door that leads directly to the outside. When evacuating upper floors, consider removing victims through upper floor windows or by roof, using ground or aerial ladders.

  **Caution:** Face Piece Removal. After exiting the rescue area, rescuers must continue using their SCBA to prevent respiratory harm from “off-gassing” of chemical agent until their decontamination is complete. The regulator and face piece must be the last items removed.

- Emergency Decontamination: Unless delay would compromise rescue, set up decontamination area before entry is made, locate setup as close as practicable, and monitor operations. Rescuers must remove their protective clothing before removing their regulator and face piece to avoid breathing any vapors possibly trapped in their clothing. Use chemical agent monitors.

- Medical Monitoring: Check vital signs and ECG. Check again for chemical agent signs and symptoms.

- Rehabilitation (REHAB): Provide rest and re-hydration. Re-check vital signs as necessary.

Remember this Quick Reference is just a guide. Existing conditions, knowledge of the chemical agents, good judgment, combined with available personnel and personal protective equipment, will greatly influence what level of protection is used by rescuers. The safety of both the rescuers and victims is of paramount concern. When level A suits are not available, the mission of protected rescuers is to rescue live victims, nothing more.

## Review this reference periodically to improve recall.

*Prepared by Deputy Chief Ted Jarboe, District Chief Robert Stephan, and Captain Jack Crowley with technical review by Roger McIntosh, M.D.*

---



---

Douglas Duncan
***County Executive***

Gordon Aoyagi
***Fire Administrator***